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ABSTRACT

The discussion of long- versus short-term effects is usually absent when it comes to the choice of training technology. Short-term effects become the major criteria for the choice: training resolves a concrete problem. An important reason for thinking about long-term effects of training and training strategies is the ultimate objective of training the European work force: to become flexible enough to face the uncertainties of the future. The Instrumental Enrichment Program (IEP) illustrates how firms and human development specialists deal with the dilemma of short- and long-term effects. IEP is an intervention program to improve cognitive development and thus make learners more eager and more able to learn. The research and evaluation of experimental applications of IEP in the workplace have not achieved the same positive, long-lasting effects of cognitive change that have been verified with children. The strongest and most interesting promise of the method--that learning ability increases over time as an effect of an adequate IEP intervention--is generally hindered by the short duration of the majority of the applications. Two related issues arise from the results of IEP intervention. First, the dilemma between short- and long-term effects might not be a real dilemma. A major strategic decision facing training planners concerns the choice of those means which simultaneously respond to short- and long-term goals, not a choice between the short and the long term. Second, the choice of training technologies necessarily reflects strategic decisions, so that improving the analytical quality of the decision rules used by training practitioners can be seen as a mirror image of the changing mood in the world of training. Hence, the human resource specialist must learn to think in action, to become a reflective practitioner. (Contains 14 references.) (YLB)

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by Joao Batista Araujo e Oliveira and Alex Lau

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by Joao Batista Araujo e Oliveìra and Alex Lau

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Summary

The paper discusses the issue of training technology choice as a strategic choice between short- and long-term goals. Using the example of the Instrumental Enrichment Programme, the authors discuss how the over-emphasis on short-term goals and the myopia over research and evaluation may prevent corporations from extracting the full benefit of training technologies, thus compromising the ultimate objective of training the European workforce to become flexible to face the uncertainties of the decades to come.

Introduction

A classic dilemma for training strategists is to find the right balance between the short- and the long-term effects of training interventions. Every discreet choice of training programmes, methods and technologies reflects this dilemma.

The empirical observation of training technology choice at the firm level displays a range of possibilities. At their worst, choices are based on naive, enthusiastic, acritical justifications. This can be observed in professional meetings of human resources specialists, including the previous European Training Technology Event (ETTE) conference. The more glaring the technology, the more likely it is to dazzle the uncritical practitioner. In the intermediate case, technologies are used because they seem to work at the neighbours' plant. In the best cases, training technologies are chosen because the firm is familiar with them - but usually no rigorous comparison is made with other possible alternatives. Exceptions exist - but only to confirm the rule.

Training, almost by definition, is primarily concerned with the short-term, and so it should be. The discussion of long- versus short-term effects is usually absent when it comes to training technology choice. The short-term effects become the major criteria for the choice: training resolves a concrete problem, be it to enable workers to use a new machine, to solve a conflict or to eliminate a production bottleneck.

However, there are very important reasons to think about training besides and beyond the short-term needs. Exogenous, pressuring reasons include technological change, the uncertainty associated with future changes in production modes and work technologies, the changing demographic profile of the European workforce, the migration trends in the continent, and the profile of the migrant workers. But there are even more important reasons for thinking about long-term effects of training and of training strategies that create long-term capabilities, such as learning to learn. It is through such interventions that individuals might become more flexible, more independent, more able to think clearly, to communicate, to participate in groups and to develop themselves. Is this not what we trainers preach?

When it comes to training technology choice, the wisdom consists of identifying those training strategies and technologies which are able to yield cumulative effects beyond the short-term. This is easier said than carried out, and constitutes the core of the discussion of the present paper.

If we agree on the need to consider long-term effects of training interventions, the question then becomes: how to choose such strategies? What are the roles of the firms and the human development professionals? What is the role of research in improving our capability to choose such technologies which maximise the balance between the short and the long-term effects of training? These are the types of questions that this paper will attempt to discuss.

The Instrumental Enrichment Programme (IEP), designed and developed by Reuven Feuerstein (1980), will be used here to empirically illustrate how firms and human development specialists deal with the dilemma of short- and long-term effects discussed above. The final section will discuss which lessons can be derived from this case which might be applied to strategic choice of training technologies.

The case of the Instrumental Enrichment Programme (IEP)

IEP is not a training technology in the strict sense of the word. It is an intervention programme to improve cognitive development and has been used for over 40 years with children. Since the mid-eighties it started to be used for adult training in a number of European countries, as well as in North America. The major purpose of IEP is to promote cognitive change and development, thus making learners more eager and more able to learn. There are three major domains

of change envisaged, *perception* (how to perceive the information), *elaboration* (how to deal with information) and *communication* (how to decide on which information to use).

The programme is composed of a set of 14 batteries of instruments and tests, each one with specific objectives, such as space orientation, comparisons, analytical perception, classification, relations of hierarchies, time or sequences, and decision-process. The programme is implemented by industries in a number of formats, the duration of interventions ranging from 20 to 200 hours. Interventions are led by a mediator, whose role is fundamental for the success of the programme (Delage, 1990).

Even though IEP is not a training technology per se, it bears a profound resemblance to any genuine training technology: objectives are clear; instruments and means are directly related to the objectives; media are selected according to the learning objectives and the characteristics of the learners; evaluation is a permanent and integral part of the programme. Even though the current versions of IEP do not use media, there is work in progress between the University of Jerusalem and the University of Geneva to incorporate computers and interactive technologies for the delivery of IEP.

More germane to the present discussion is the fact that IEP explicitly intends to promote both short- and long-term objectives. In the short-term, it is often used to de-freeze cognitive capabilities of adults, to prepare workers to accept change, or to develop specific basic skills and capabilities considered relevant for specific training purposes, such as dealing with technical subjects or even more specific intellectual capabilities, such as mechanic or spatial relations relevant for a given training course. In the long run, IEP intends to modify the cognitive ability of adult workers, to improve self-perception, self-image, the ability to deal with groups and, ultimately, the ability to learn how to learn.

Besides the two reasons above, IEP is probably one of the most research-based training tools available, and certainly so in the category of instruments related to thinking skills. There is a thorough, theoretical underpinning behind the programme, and a wealth of research and evaluation of specific interventions both with children and adults in industrial situations (Buchel, 1983; Savell, Twohig and Rachford, 1986; Martin and Paravy, 1990; Debray, 1988). In France, where IEP is extensively disseminated, there are two university departments (Paris and Lyon) devoted to research on IEP and related matters.

IEP has two distinctive characteristics vis-à-vis other training methods for teaching thinking skills. First, it is theoretically based, thus allowing explicit hypotheses to be tested - which is not the case of most thinking skills approaches. Second, it is comprehensive, covering a full range of intellectual skills, differently from similar programmes geared towards developing specific abilities, such as Tanagra, Kang, ARL, Mialet, Activolog, or Aga (Formation France, 1989, p. 12).

Before discussing how IEP is normally used in industries, let us examine the evidence concerning the effectiveness of this intervention to reach short- and long-term goals.

What research and evaluation says about IEP

There are two major streams of evidence concerning IEP. The first, more positive and robust results concern the uses of IEP and the test of its underlying theoretical hypotheses with handicapped children since its early uses in 1944 (Feuerstein, 1980; Sternberg, 1986; Savell, Twohig and Rachford, 1986). We can briefly summarise the results of these studies in the following way:

- when used with children, IEP normally follows the recommended long-term approach, with the IEP interventions covering a relatively long period of time,

coupled with other teaching activities inside or outside the school to maximise learning and transfer;

- the overall results based on children in school and out-of-school situations show a good, solid evidence for both the theory and the application. Both short and long-term learning and transfer effects are observed and measured under controlled experimental circumstances.

Industrial applications have been researched mainly in France and Switzerland (Buchel, 1983; Buchel, 1990; Debray, 1988; Delage, 1990; Martin and Paravy, 1990; Vidalo, 1990). The results are generally positive, but they are also less spectacular. This is not only due to the limitations of the methodologies used in these evaluation studies, but particularly to the ways in which the programme is implemented. A major difference exists in the experimental, long-term applications typical with children as opposed to the short interventions typical of industrial applications.

But even in the cases in which more or less controlled experiments and evaluations are put in place in connection with industrial applications of IEP, methodological hurdles make it difficult to reach firm conclusions. Without becoming overly technical, let us explore these methodological issues a bit further before we discuss the actual results obtained in these applications.

According to a long-time student of IEP, Professor Buchel, of the University of Geneva (Buchel, 1991), compared to other approaches the IEP research and evaluation in industrial settings presents the following characteristics:

- much less rigourous research and evaluation has been attempted. Typical evaluation studies are of the pre/post-test type, and not much can be proved with these methodologies. Most of the available studies are simplistic and full of methodological flaws. The variable extent, intensity, and duration of the interventions make it virtually impossible to compare results from different interventions;

- intrinsic difficulties make it very hard to evaluate the learning and transfer which can be derived from IEP. Among those are the long-term purpose of the method; a great number of variables is involved; the difficulty to isolate variables; applications and extent of generalisation depend on extent of opportunities to use the knowledge and skills acquired in new training and work opportunities. Moreover, IEP might work better for some individuals than for others, and thus the average gains might mask main effects. For example, individuals with lower intellectual levels may gain more from IEP, but will contribute to lowering the averages; people not using the newly acquired skills in everyday work may have lower performance levels than younger people or engineers engaged in daily applications.

As far as the results obtained from these studies are concerned, the more positive outcomes associated with industrial applications of IEP are related to enhanced motivation to study, increased sociability, better communication and willingness to accept change. These are not trivial results, particularly as they address basic skills critically relevant to the introduction of new work technologies. Yet IEP's major promises are related to increasing the cognitive ability overtime and to the transfer of these new abilities to specific applications encountered in training and real-work situations (Lau, 1991). The results in these cognitive areas are not negative, but are certainly far less encouraging. So far, the research and evaluation of experimental applications of IEP have not reached the same positive, long-lasting effects of cognitive change verified with children. The strongest and most interesting promise of the method, i.e., that the learning ability increases over time as an effect of an adequate IEP intervention, is generally hindered by the short duration of the majority of the applications.

Perhaps the most interesting and consistent findings from the studies quoted above are the correlations between training of mediators, length of intervention and simultaneity of IEP and other substantive training interventions on the one hand and the broader and longer-term effects of IEP on learning and transfer on the other. These trends coincide and reinforce the more consistently positive results found with children. In other words, when IEP is properly implemented, with adequate training and planning and a long-term perspective, its long-term effects start to show up.

What does this brief discussion suggest? Broadly speaking, it suggests that relevant, long-term effects can be reached with children and with industrial applications which follow the standard procedures. This is typical, for example, of the interventions initiated by universities or which are research motivated. However, in most of the IEP applications initiated by firms and documented in the literature as well as in those directly observed by the authors in various enterprises in the Haute-Savoie region in France, there is a marked trend towards using IEP as a specific tool to help overcome very urgent needs, rather than as a general approach to develop longer-term educational and training goals. Ideally, and according to Feuerstein, the programme should be used over a 160 to 200-hour period, overlapping with other training activities. In practice, most interventions range from 20 to 80 hours.

Why this apparent myopia from human resource specialists? Is it because they ignore the research basis of this - and other promising interventions and technologies? Is it because they do not pay enough attention to the need to develop long-term capabilities in the workforce? Is it because they are unable to persuade their managers that it is worthwhile to strategically invest in training strategies, technologies and interventions which take time but yield long-term results? Is it because research and evaluation are still not an integral part of human resources development?

When asked why they are using IEP, many managers and human resources specialists in our informal sample responded that they saw that it worked in the neighbour's industry, hence it might be worth trying to use it in their own firms. A few industries which did not use IEP and adopted other strategies, such as Transaction Analysis, did so not because of the evidence about IEP, but for practical reasons, usually associated with time requirements. Overall, the tendency is to use IEP - and any other training strategy - in the most applied, concrete, and short term possible. As for the long term, no questions are usually asked.

Is this a good business strategy? Is this a good training strategy? Is this how practitioners should deal with technology choice?

Here we face a classic case in which the potential of a reasonably researched and robust intervention cannot be fully exploited. Practitioners may shy away from a full intervention and a thorough evaluation because of the costs, the time and the difficulties and uncertainties associated with the evaluation. By doing so, one of the issues they might be overlooking is the fact that the central evaluation question with IEP - as well as with most training technologies - is not whether they work, but **under what conditions they work better, and what they work for.** This is why new time dimensions need to be integrated into the planning and evaluation of training, if technology choice is to become strategic to human resource development.

In spite of the official discourse about learning to learn and permanent education, managers seem to be focusing only on the short term and the cost implications of any training effort. Moreover, they are not necessarily concerned - and much less convinced - of the need to balance short- and long-term concerns. After all, they are doing much more than in the past, aren't they?

The next question then is: given the challenges of new technologies, new demographics and new uncertainties, can the organisations of the twenty-first century be so casual about the issue of short and long-term effects of training? Is training a tool to adapt workers to new situa-

tions or a means to help them to become more adaptable? If the second is the right answer, should managers and practitioners alike not become more rigourous about the evaluation, the choice, and the long-term effects of training interventions?

Towards the reflective training practitioner

Two related issues arise from the foregone discussion, which might be useful for the consideration of firms, managers and practitioners faced with developing the European workforce to meet the unknown challenges of the next century.

First, it seems that the dilemma between short and long term might not be a real dilemma. A major strategic decision facing training planners concerns the choice of technologies, programmes and methods which simultaneously respond to short and long-term needs. The evidence about IEP, scarce and limited as it might be, suggests that some interventions are more likely to meet both goals if properly adopted and implemented. In this specific case, the simultaneous use of IEP with other, content-oriented training interventions seems to yield the best results. Once again, the emphasis on intended results rather than on training means, media or technologies - seems to be the best guide for decision. The dilemma becomes a choice of those means which simultaneously respond to short and long-term goals, not a choice between the short and the long term.

Second, **the choice of training technologies necessarily reflects strategic decisions**. The message is the medium. Training strategies can be naive, ill-informed or more sound. As discussed in this paper, the legitimate concern in the short term may lead to myopic and in the long term may lead to erratic, costly choices of training technologies. Practitioners usually decide on the basis of very limited information about the short-term effects of an intervention.

Improving the analytical quality of the decision rules used by training practitioners can be seen as the mirror image of the changing mood in the world of training. In the training of technicians, for example, the emphasis on theoretical, reflective, analytical work has been increasing dramatically. Nowadays students in technical schools spend more time on planning, designing and evaluating the results of their work, rather than on performing operations at the workbench. Becoming more conversant with research, evaluation and hypothesis testing is essential to improve the quality of decisions regarding training technologies and their effects in the short and long term. An experimental, experiential, rigorous evaluation mind is increasingly becoming an essential ingredient of the profile of the human resource specialist. As D. Schon put it, the human resource specialist must learn to think in action, to become a reflective practitioner (Schon, 1983).

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